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COMPUTER SCIENCE NOTES

Federal Board Islamabad

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9TH
CLASS

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 1)

SHORT QUESTIONS

Describe Napier's Bone and Slide Rule.

Napier's Bone:

- It was a calculating device invented by John Napier (Scottish Mathematician) in 1614.
- It consisted of a wooden box containing rotating cylinders having digits from 0-9.
- It could multiply, divide and find square roots of numbers.

Slide Rule:

- It was device developed by William Oughtred (English Mathematician) in 1920s.
- It was based on the idea of logarithm.
- It is used to solve problem of multiplications and divisions.
- It has 3 parts. Slide, Rule and Sliding Cursor.

Compare 1st and 3rd generation computers.

First Generation Computers (1940-1956):

- i) They used vacuum tube technology.
- ii) Vacuum tubes produce lot of heat and needs to be cooled with A.C.
- iii) Their examples were ENIAC, UNIVAC-I, IBM-604, Mark-I and EDSAC etc.
- iv) This generation computers had following short comings:
 - a. Very big in size
 - b. Slow in speed and have less memory
 - c. Large power consumption
 - d. Difficult maintenance.

Third Generation Computers (1963-1971):

- i) They used Integrated circuits consisting of transistors, diode and resistances.
- ii) These computers were smaller and consume very less power.
- iii) These computers used more versatile programs like real time programming.
- iv) They can run different applications at the same time.
- v) Their examples were Burroughs 6700, IBM System / 360, System 3 and Control Data Corporations 3300 and 6600.

Differentiate between analog and digital computers.

Analog computers:

- Analog computers represent and process data by measuring quantities such as voltage and current to solve a problem.
- They work on supply of continuous signals as input.
- They are special purpose devices, designed to perform single specific task.
- Analog computers are very fast but their accuracy is low.
- They consist of electrical devices such as resistors, capacitors transistors etc.

Digital computers:

- They work on binary digits i.e. 0s and 1s.
- Their result is displayed on monitor or printed on paper.
- These are general purpose computers in many sizes and shapes.
- These computers accept data in the form of digits.
- They have low speed than analog computers but accurate.
- They have high memory capacity.
- They are being used in business, education, health, supermarkets & banking.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 1)

Ahmed, a class IX student is asking his father to replace his home computer CRT monitor with LCD monitor. How will you justify his demand?

- LCDs are free from geometric image distortions because they are a flat matrix display where every pixel is active.
- LCDs have uniform screen brightness and the screen is covered with a flexible surface which is less prone.
- LCDs are flicker free and avoid headaches and eyestrain.
- LCDs are smaller than CRT monitor.
- LCD needs lesser energy than CRT Monitors.

What will happen if storage devices are removed from a computer?

If storage devices are removed from a computer then it will not possible to store the information and information retrieval.

Differentiate between systems software and application software.

System Software:

- It is a collection of programs which makes the use of computer easy and efficient.
- Highly experienced computer programmers develop system software.
- For example operating system, device drivers and utility program etc.

Application Software:

- Application software is developed for computer users to solve their problems such as preparing a letter, creating a presentation or managing a database.
- Commonly used application software includes productivity software, business software, entertainment software and education software.

How a student can use computer to improve academic performance?

Using Computer Applications will:

- Increase the motivation in student.
- Increase the interest for learning Management.
- Lead to the development of students' skills.
- Develop the students' process of thinking critically.
- creates the opportunity for students to solve different case studies
- Prepares the students for the knowledge-based society and economy.

Give any three uses of computers in a school library.

- Access to information and primary information sources.
- Network accessibility on Intranet and Internet.
- User-friendly interface.
- Advanced search and retrieval.
- Multiple access / Universal accessibility.
- Integration with other digital libraries.

Name few house hold appliances in which microprocessor is used.

They are being used in the devices including mobile phones, microwave ovens, cameras, washing machines, televisions, etc.

What are the tasks performed by operating system?

- It loads programs into memory and executes them.
- It controls the operation of input/output and storage devices.
- It manages files and folders.
- It allows creating a password to protect computers from unauthorized use.
- It detects hardware failures and displays messages to fix them.

ختم نبوت ﷺ زندہ باد

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معزز ممبران: آپ کا وسیلہ ایپ گروپ ایڈ من "اردو بکس" آپ سے مخاطب ہے۔

آپ تمام ممبران سے گزارش ہے کہ:

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اللہ تبارک تعالیٰ ہم سب کا حامی و ناصر ہو

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 1)

LONG QUESTIONS

Describe the five generations of computers.

First Generation Computers (1940-1956):

- i) They used vacuum tube technology.
- ii) Vacuum tubes produce lot of heat and needs to be cooled with A.C.
- iii) Their examples were ENIAC, UNIVAC-I, IBM-604, Mark-I and EDSAC etc.
- iv) This generation computers had following short comings:
 - a. Very big in size
 - b. Slow in speed and have less memory
 - c. Large power consumption
 - d. Difficult maintenance.

Second Generation Computers (1956-1963):

- i) They used transistors instead of vacuum tubes.
- ii) They are reliable and cheaper.
- iii) They used punch card readers, magnetic tapes and printers.
- iv) They use assembly language.
- v) High level programming languages were introduced like FORTRAN and COBOL in these computers.
- vi) Their examples were UNIVAC-II, IBM 7030, 7780 and 7090, NCR 300 etc.

Third Generation Computers (1963-1971):

- i) They used Integrated circuits consisting of transistors, diode and resistances.
- ii) These computers were smaller and consume very less power.
- iii) These computers used more versatile programs like real time programming.
- iv) They can run different applications at the same time.
- v) Their examples were Burroughs 6700, IBM System / 360, System 3 and Control Data Corporations 3300 and 6600.

Fourth Generation Computers (1971-Till Now):

- i) They use LSI (Large Scale Integration) and VLSI (Very Large Scale Integration) chips.
- ii) Microprocessors were also developed in fourth generation.
- iii) They are very fast and have large memory capacity.
- iv) Large variety of softwares are present in these computers.
- v) They support multimedia software that combine text, image, sound and videos.
- vi) They use modern languages like C, C++, Java etc.
- vii) Their examples are Pentium Series, Dual Core, Core i3, i5 and i7 etc.

Fifth Generation Computers (Upcoming):

- i) This generation is currently under process.
- ii) Scientists are trying to design such machine which can think and understand natural languages.
- iii) They will be based on Artificial Intelligence.
- iv) Their examples will be robots and expert systems.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 1)

Write a note on mainframe, minicomputer and microcomputer.

Mainframe Computer:

- These are very large, powerful and expensive.
- They can support hundreds and thousands users at a time.
- Modern mainframe computers use cutting edge technology.
- They can execute trillions of instructions per second.
- Examples are IBM zEnterprise EC12, EC196, HP16500 etc.

Minicomputer:

- These are introduced in 1960s after development of IC chips.
- These are less expensive and smaller than mainframe computers.
- They can execute Billions of instructions per second.
- They are also using cutting edge technology now a days.
- Their examples are IBM System/36 and HP 3000.

Microcomputer:

- These are less expensive and smallest computers.
- These are being used in all application areas like homes, offices etc.
- These are introduced in 1970s after development of micro-processor.
- They can execute millions of instructions per second.
- Their examples are IBM, HP, Dell, Toshiba etc.

Explain the basic operations of a computer.

Input Operation:

- A computer works in the light of instructions (Input) given to it.
- Input is given by a user using keyboard or mouse.
- The input is stored in memory for further processing.

Processing Operation:

- Microprocessor processes the data according to instructions (input).
- Microprocessor fetches the data from memory and Control Unit (CU) decodes the instructions.
- After decoding, it sends signals to other parts of computer to execute it.

Storage Operation:

- The result produced after processing are stored in memory before sending to output device or hard disk.

Output Operation:

- The Control Unit displays the results on the monitor or print it on paper. Results can also be saved on hard disk for future use.

Write short note on the followings.

Hardware Engineer:

- He is a person who design and manufacture computer hardware.
- He also do repairing and maintenance of computers.
- He has deep knowledge of computers, processors, circuit boards, input & output devices etc.

Network Administrator:

- He is a person, who install configure and maintain the computer network.
- He is incharge of computer hardware and software used at the network.
- He give password to network users to access the network.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 1)

Database Administrator:

- He is a person, who design, implement and maintain the databases.
- He also ensures the security of database.

Web Designer:

- He is a person, who creates and designs the websites.
- He uses different elements and languages to create websites.

Multimedia Designer:

- He is a person, who presents information in attractive manner.
- He creates digital images and videos using various software.
- He can edit, split and combine images and videos.

Describe the following types of application software.

Productivity Software:

- They include word processing, spreadsheet and database management.
- They are used to speed up daily routine tasks.
- They help to work in organized and efficient manner.

Business Software:

- They help to run any kind of business in efficient way.
- Some examples are accounting, sales, marketing and inventory softwares etc.

Entertainment Software:

- They are used for entertainment purpose.
- Games are most popular entertainment softwares.
- They also help to improve skills like typing tutors etc.

Education Software:

- They are used for education purpose.
- They include typing tutors, spelling tutor, language learning, medical, driving test, flight simulation etc.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 2)

SHORT QUESTIONS

Why operating system is important software for a computer? Give any five reasons.

Following are the main functions due to which operating system is important software for a computer.

- i) Process Management
- ii) Memory Management
- iii) Input/Output Management
- iv) File Management
- v) Resource Management
- vi) User Management

Give any three objectives of operating system?

- i) Convenience and Efficiency.
- ii) Usage of resources such as CPU, memory, input/output devices and Internet.
- iii) Resource manager.

Mention few disadvantages of using DOS.

- User must know the syntax of the command.
- DOS commands are difficult to remember.
- It is a single user and single task operating system.
- It cannot support graphics.
- It is not GUI based.

Name two operating systems which are used in modern mobile phones.

- | | |
|---|--------------------------------|
| i) Android OS (Google Inc.) | ii) Bada (Samsung Electronics) |
| iii) BlackBerry OS (Research In Motion) | iv) iPhone OS/iOS (Apple) |
| v) MeeGo OS (Nokia and Intel) | vi) Symbian OS (Nokia) |

What difficulties a student may face if he/she is not familiar with the operating system of a computer?

- User must know basics of operating system to give commands to the computer.
- Without this, he/she cannot run programs and manage files on computer.
- Without knowledge of operating system, a computer is useless.

Define UNIX and Windows operating system.

UNIX:

- UNIX is a multi-user CLI operating system.
- It was introduced in 1969.
- It allows multiple users to run different programs at the same time.
- UNIX is used on large computer system (Mainframe).
- It uses a command line interface but later on GUI was also introduced.

Windows Operating System:

- It is the most popular operating system.
- It was developed by Microsoft.
- It has many versions over the period of time like Windows 95, Windows 98, Windows Millennium, Windows XP, Windows Vista, Windows 7, 8 and 10.
- The latest version is Windows 10.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 2)

Differentiate between single-user and multi-user operating systems.

Single-user Operating System:

- It is used by a single user at a time.
- It is easy to use.
- Resources (CPU, memory and input/output devices) are not shared with other computers.
- It is used on microcomputers.
- User can open many programs at the same time
- It requires less memory and costs less.
- Some examples are DOS, Windows 95, Windows XP, Windows 7, etc.

Multi-user Operating System:

- It is used by many users at a time.
- Resources (CPU, memory and input/output devices) are shared with other computers over network.
- It is used on minicomputers and mainframes.
- Administrator is responsible for assigning and managing user names and passwords.
- It requires a powerful CPU and large memory & hard drives.
- Some examples are Windows NT, UNIX and Linux etc.

What is meant by managing data and why is it important?

- Managing data means storing files in secondary storage devices i.e. on hard disk or USB flash.
- This helps in finding files easily and quickly.
- File Management Tools provide facilities to create folders and copy or move files into them. It also allows the user to delete files and folders.

What is meant by resources of computer?

- The resources of a computer include microprocessor, memory and all the attached devices.
- Operating system automatically manages these resources.
- Operating system allocates resources of a computer to the application program according to the user's requirement.

What types of problems may a student face if no antivirus is installed in his/her computer system.

- A computer virus is a program that literally infects other programs and databases upon contact.
- It can damage data, software, or the computer itself.
- Some of the activities that a virus are:
 - Copy themselves to other programs.
 - Display information on the screen.
 - Destroy data files.
 - Erase an entire hard disk.
 - Lie dormant for a specified time or until a given condition is met.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 2)

LONG QUESTIONS

Explain the main functions of operating system.

The following are the main functions of operating system.

Process Management:

- A process is a program in execution which needs resources like processing resource, memory and I/O resources.
- The Operating System must allocate resources to processes the data.

Memory Management:

- It is the process of allocating memory space to different programs.
- When programs are run by users, the operating system allocates portions of free memory these programs.
- When a program is closed, operating system will free the memory portion used by that program.

Input/output Management:

- User communicates with computer through input/output devices such as keyboard, mouse, monitor, printer etc.
- Operating system uses Input/output controller to manage all the input/output devices.

File Management:

- It is the process in which operating system organizes, stores and keeps track of files and folders.
- Operating System perform various operations on these files/folders like creating, opening, editing, renaming, moving, copying, deleting and searching etc.

Resource Management:

- The resources of a computer include microprocessor, memory and all the devices attached to the computer.
- Operating system automatically manages the resources of a computer when application programs are executed by user.

User Management:

- User management is an important feature of operating system for a secure computer system.
- The operating system gives full control to administrator only who can installs various programs and can creates new users.
- Operating system does not allow the users to install programs or create new users.

Describe the following computer interfaces.

Command Line Interface:

- In CLI, commands are given with keyboard.
- The user types a command and presses the ENTER key to execute it.
- Examples of CLI are DOS (Disk Operating System) and UNIX.
- CLI is difficult to use because users have to remember the commands.

Graphical User Interface:

- It is a graphical interface and uses windows, icons, menus and pointer.
- Icon is a graphical symbol that represents a file, folder, program, device, etc.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 2)

- =====
- To perform a task, the user has to select icons or make choices in menus.
- Examples of GUI are Macintosh, Linux and Windows.
- The following are the **advantages** of GUI.
 - Much easier
 - No need to remember commands
 - Multiple programs can be run at the same time
 - Provide good help facilities
- The following are the **disadvantages** of GUI.
 - Takes up lot of memory.
 - Needs faster computer.

Menu-driven Interface:

- It presents a menu, user makes a choice and then the next menu appears.
- The user makes another choice and so on.
- It is very easy to use.
- Menus contain the commands to use the operating system.
- Examples are Novell's Netware and ProDOS etc.

Describe the following types of operating systems.

Batch Processing System:

- In this system, jobs are grouped in batches & computer executes them one by one
- Computer automatically loads the next job when one job terminates.
- This system is suitable where large amount of data has to be collected and processed on a regular basis.
- For example, data of credit card holders is collected & held till end of billing cycle.
- Another example is printing of report cards of all students of a school as a batch.

Time-sharing System:

- In this system, multiple users can run different programs at a same time on a large-scale computer.
- In a timesharing system, the central processing unit is switched rapidly between the programs so that all the user programs are executed simultaneously.
- The, operating systems used in minicomputers and mainframe computers support timesharing.
- This system is used in organizations like airline, bank, hotel, university, etc. where many users need access to the central computer at the same time.
- For example, hundreds of students access the university's mainframe computer at the same time to check their result / datesheet etc.

Real-time System:

- This system must process information and produce a response within a specified time.
- These operating systems are developed for special applications.
- For example a measurement of temperature from an oil refinery indicating high temperature might demand quick response to avert an explosion.
- There are a number of real-time operating systems used in military and space research programs.
- For example, real-time operating system is used to monitor the position of rocket in the space.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 2)

Write notes on Macintosh and Linux operating systems.

Macintosh Operating System:

- Mac OS is a series of operating systems developed by Apple Incorporation.
- It was introduced in 1984.
- The latest version is Mac OS X.
- It is a UNIX based user-friendly operating system.
- There are some specialized versions of Mac OS X used on devices such as iphone, ipod, ipad and new Apple TV.

Linux Operating System:

- Linux is free open-source operating system introduced by Linus Torvalds in 1991.
- It is faster but difficult to use as compared to Macintosh and Windows operating systems.
- It is not a popular operating system.
- Millions of programmers around the world working on Linux to improve it.
- Its source code is freely available on Internet.
- Linux OS can be installed on PCs, laptops, netbooks, mobile and tablet devices, video game consoles, servers, supercomputers and more.
- Popular Linux OS distributions include Debian, Ubuntu, Fedora, Red Hat and openSUSE etc.

Describe the basic icons of Windows operating system.

An icon is a small graphical symbol that represents a file, folder, application or device. There are some special system icons SUCH as Recycle Bin and Computer that are kept on the desktop. Some of them are described below:

Recycle Bin Icon:

It is temporary folder that keeps the deleted files, so that user can restore it when needed. However, user can delete a file permanently from Recycle Bin also.

Computer Icon:

It allows user to access all computer's resources like drives of Hard Disk etc.

Folder Icon:

It is used to store files. A folder can have another folder inside it which is known as subfolder. Folders are used to keep files in an organized manner on a storage device such as hard disk so that they can be accessed easily.

File Icon:

In a GUI, files are also represented by icons. A file may contain text, image, music or video. Users recognize a file by its icon.

Program Icon:

Executable program files are also represented by icons. Different graphical symbols are used for different program icons.

Shortcut Icon:

Shortcut icons are created to access a program, file or folder quickly. They have an arrow at the bottom left corner and the name below it.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 3)

SHORT QUESTION

What is a word processor? Write some advantages of it over a typewriter.

- Word Processor is commonly used application software for creation of different documents.
- Word Processor allows user to delete, modify and re-arrange document without retypling.
- A common word processing program is Microsoft Word. It is a part of Microsoft Office suit.

Advantages:

- We can delete mistakes.
- We can check spelling & grammar.
- We can use different fonts and different size.
- We can save document for future editing.
- We can email it.

We cannot do the above tasks on typewriter.

Name any three types of documents, which can be prepared in Word.

- i) Letters.
- ii) Reports
- iii) Resumes
- iv) Memos
- v) Newsletters

Differentiate between page break and section break.

Page Breaks:

- A page break is a marker that tells Word program that the followed contents are to appear on a new page.
- Word automatically inserts a page break when the user reaches the end of a page.

Section breaks:

- A section break also inserts a new page but it allows the user to change the page format without having any effect on the formatting of the previous pages.
- For example, section break can be used to break a document into sections having different header and footer for each chapter of a book.

Why header and footer are important in a Word document?

- Header refers to information that appears at the top of each page.
- Footer refers to information that appears at the bottom of each page.
- The type of information that may appear in the header or footer includes book title, document title, chapter number and title, page number, company name etc.

What is the purpose of control buttons in Word window?

- Every window has a set of three buttons (Minimize, Maximize/Restore and Close buttons) on top right side. These are called control buttons.
- We can minimize a window from the view by clicking the **Minimize** button.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 3)

- We can **Maximize** window by clicking the maximize button that enlarges the window to fill the entire screen.
- When a Window is maximized, a **Restore** button appears in its place. With the **Restore** button you can return the Window to its original size.
- We can close a window by clicking the **Close** button.

Why hyperlinks are created in Word document?

- We can add hyperlinks to the document that give access to information in another part of the same document.
- We can also add hyperlink to another object or location. An object can be a Word file, an HTML web page, an image, sound file, video or other digital file.

Name any three areas of application of Excel.

Excel allows us to perform calculations (like a calculator) and manipulate text (like a word processor). Following are the areas of application of Excel:

Conditional Formatting:

Conditional formatting helps users to quickly focus on important aspects of a spreadsheet or to highlight errors and to identify important patterns in data.

Sorting and Filtering:

Sorting and Filtering your data will save you time and make you spreadsheet more effective.

Basic Math:

We can type the calculation you want to perform directly into the cell or the formula bar and when you press Enter, the answer will show in the cell.

Pivot Tables:

Pivot Tables summaries large amounts of Excel data from a database that is formatted. In pivot tables the first row contains headings and the other rows contain categories or values.

Differentiate between relative and absolute cell addressing in Excel.

Relative Cell Addressing:

Relative cell address means when a formula is copied to other cells, the cell references in the formula change to reflect the formula's new location. For example formula (=C1+C2) present in C3. If you copy it in D3, it will change to (=D1+D2).

Absolute Cell Addressing:

Absolute cell addressing keeps a cell reference constant when copying a formula or function. Absolute cell addresses begin with a dollar sign in the formula, such as = \$C\$5 + \$D\$5.

What are the advantages of protecting an Excel worksheet?

- Sometimes the data in your worksheets contain important information that you may not want others to edit or delete.
- For this, you can protect sensitive information in elements down to the cell level in Excel.
- When a worksheet is protected, other users can only view the information but cannot make changes in it.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 3)

How graphical representation of spreadsheet data can be helpful in business.

- A chart is used to represent data graphically.
- Charts are very helpful in explanation and representation of data.
- A commonly used chart is the column chart.
- Using pie charts, graphs and clustered columns adds meaning to data; otherwise, it may just exist as row after row of numbers.
- These visualizations can add extra emphasis to business reports and persuasive marketing material.

LONG QUESTION

Which shortcut keys are used in Word to move cursor to the beginning of line, end of line, top of the document and end of the document?

Cursor Movement	Shortcut key
Beginning of the line	Home
End of line	End
Top of the document	Ctrl + Home
End of document	Ctrl + End

Write the mouse commands used for selecting various items in a Word document such as single word, sentence, paragraph, etc.

Items of Select	Mouse Command
Single word	Double-click the word.
Sentence	Press and hold down CTRL key and click anywhere in the sentence.
Paragraph	Move the mouse pointer to the left of the paragraph until it changes to a right-pointing arrow and then Double-click.

Explain text and paragraph formatting in Word.

Text Formatting:

- Text formatting means changing the font type, size, style, color and effects of text.
- To change the Font Type and Size of Text follow these steps:
 - Open the **Home** tab and click the arrow on the right side of the currently selected font type and choose another font type.
 - To change the font size, click the arrow on the right side of the font size and select a font size of existing text, select the text and then make the changes.
- To change the Font Style and Effects, follow the following steps:
 - Click the **Home** tab.
 - Click the dialog box launcher on the lower-right corner of the **Font** group.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 3)

- =====
- This will open the **Font** dialog box. Now, the user can change font styles and effects of text.
- Some changes that are available in the **Font** dialog box can be made directly from the **Font** group in **Home** tab.
- Following are the steps to clear the text formatting:
 - Select the text you want to clear the formatting.
 - Click the **Home** tab.
 - Open the **Styles** dialog box and select **Clear all**.

Paragraph Formatting:

- Paragraph formatting refers to change of format of text of paragraph such as font size, color, line spacing, alignment etc.
- Paragraph formatting tools are provided in the **Paragraph** group of **Home** tab and **Page Layout** tab.
- **Paragraph alignment** refers to the appearance of lines in a paragraph in relation to left or right margins. **Left align** is the default setting for paragraph alignment.
- Paragraph indentation refers to the distance of paragraph from left margin. To increase paragraph indent, click the **Increase Indent** button.
- The following are the steps for changing spacing between paragraphs and lines.
 1. Select the paragraph or paragraphs.
 2. Click **Home** tab.
 3. Open the **Paragraph** dialog box, by clicking the small arrow at the bottom right corner of the **Paragraph** group.
 4. Make the required changes.
 5. Click **OK** to apply changes.

Describe the Paste Special command used in Excel.

- Excel copies all the information in the selected range of cells when you paste data.
- Excel's **Paste Special** command allows many other options while pasting cells such as paste only formats of selected cells without contents or paste contents without formulas.
- The following steps describe the use of Paste Special command.
 1. Select the cell range to paste.
 2. Open the **Paste Special**. Paste Special dialog box will open.
 3. Select an option from the **Paste Special** dialog box and click **OK**.

Describe how functions are used in Excel with examples.

- Functions are built-in formulas in Excel that allow user to easily perform common calculations on data.
- Functions can be entered in a worksheet using keyboard
- For example, following are the steps to calculate average sale for Acer laptop computer during the first quarter using the AVERAGE function.
 1. Select cell E5 where the result will appear.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 3)

2. Type =av to display the Formula AutoComplete list.
 3. Point to **AVERAGE** function and Double-click.
 4. Select the range B5:D5 to insert it as argument to the **AVERAGE** function.
 5. Press **Enter** key.
- Using Insert Function command to Find the Highest Value:
 1. Select cell B11 where the answer will appear.
 2. Click **Insert Function** command. **Insert Function** dialog box will be displayed.
 3. Select **MAX** in the function list and click **OK**.
 4. Type B5:B8 in the **Number 1** text box of **Function Arguments** dialog box and click **OK**.
 - Using AutoSum Drop-down Menu to Find the Lowest Value:
 1. Select cell B12 where the answer will appear.
 2. Click **Formula** tab.
 3. Open the **AutoSum** drop-down menu in the **Function Library** group and select **Min**.
 4. Type the Range B5:B8 and press **Enter**.

Describe how formulas are used in Excel with examples.

- A formula is an expression that performs calculations.
- It consists of operators, constants and cell addresses.
- The standard operators used in Excel formulas are given in Table.
- Arithmetic operators used for addition is (+), subtraction (-), multiplication (*), division (/) and exponent (^).
- All the Excel formulas begin with equal sign (=) just like functions.
- For example, to multiply two numbers 4 and 7, the formula will be =4*7.
- User can also use cell addresses in formulas such as =(A4+B4)/5. This formula will first add the contents of cell A4 and B4 and then divide the sum by 5.
- Whenever the user changes the value in a cell, the result of the formula will be automatically updated. This feature known as **Automatic recalculation**.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 4)

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SHORT QUESTION

Differentiate between analog and digital signals.

Analog signals	Digital signals
It is a continuous wave that changes with time.	It is a discrete wave that carries binary information.
It is represented by a sine wave.	It is represented by square wave.
It is described by the amplitude, period or frequency, and phase.	It is described by bit rate and bit intervals.
It has no fixed range.	It has a finite range i.e. between 0 and 1.
It is more prone to distortion.	It is less prone to distortion.
It transmits data in the form of a wave.	It carries data in the binary form i.e. 0 and 1.
For example, human voice	For example, Signals used for transmission in a computer.

Why digital signals are used in computer systems?

Digital signals are used in computer system because:

- i. Information represented in digital form can be easily transmitted by series of "ON" and "OFF" signals by pulses of electricity.
- ii. A pulse "ON" can represent 1 and the absence of pulse "OFF" can represent 0.
- iii. Multiple bit (0,1) streams are used in a computer network.
- iv. Digital data can be compressed relatively easily to increase the efficiency of transmission.

Name the properties of a good communication system.

Delivery:

- A good communication system must deliver the message to the correct destination.
- For example, when e-mail is sent to a person, it is received only by the person to whom it is addressed.
- This is managed by the protocol.

Accuracy:

- System must deliver the message accurately without any change.
- For example, when data is transmitted over a long distance, it may get corrupted due to transmission errors.
- The data that is not correctly received at the destination is retransmitted from the source.
- This is also ensured by the protocol.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 4)

Timeliness:

- The system must deliver the data without significant delay.
- It is very important in real time transmission such as video conferencing.
- For example, a computerized real-time system is used to monitor the temperature in an oil refinery. If the temperature is getting too high, it must be transmitted immediately otherwise there can be an explosion.

Give any three reason why guided communication medium is more reliable than unguided medium.

- Guided media reduce cross talk and electromagnetic interference.
- It provides high quality transmission at extremely fast speed.
- It can transmit trillions of bits per seconds.
- It is not affected by electromagnetic fields and can transmit both analog and digital signals.
- It is used for data transmission over long distance.
- It has multipath interference, due to reflections from land, water, natural and human-made objects.

What is meant by transmission impairment?

- The errors that occur during data communication from one point to another are called transmission impairments.
- Impairments occur due to imperfect characteristics of communication medium.
- Due to this, the received and the transmitted signals are not always the same.
- The types of impairments are:
 - Attenuation
 - Amplification
 - Distortion
 - Cross talk

Differentiate between attenuation and distortion.

Attenuation:

- Attenuation is the fall of signal strength with the distance.
- If the attenuation is too much, the receiver may not be able to detect the signal at all.

Distortion:

- Distortion refers to change in shape or frequency of digital signal.
- Communication line delays the signal frequency by different amounts because different frequency components travel at different speed.
- This causes distortion in digital signals.

What is cross talk?

- Cross talk occurs in guided media.
- As signal is transmitted through a wire, undesired signals enter the path of the transmitted signal due to electromagnetic radiation.
- It is caused because of putting several wires together in a single cable.
- Sometimes, user can hear another conversation in the background when talking on the phone.
- This happens by the coupling between two wires that are close to each other.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 4)

What is Dial-up modem? Why is it used?

- Dial-up modem provides internet connection through telephone line.
- Maximum speed of Dial-up modem is 56 Kilobits per second which is very slow.
- It is being replaced by faster DSL connection for Internet.

Uses of Dial-up Modem:

- A telephone line is used for voice transmission which is analog signal.
- A modem converts digital computer signal to analog form for transmission over telephone line. This process is called **modulation**.
- Another modem at the receiving end, converts the analog signals back to digital form which is called **demodulation**.

Define data rate and baud rate.

Data Rate:

Data rate is the speed with which data can be transmitted from one device to another. It is generally measured in Kilobits (thousand bits) or Megabits (million bits) per second.

Baud Rate:

Baud is the rate of change of electrical signals per second during data communications. An electrical signal can have two or more than two states to represent binary digits 0 and 1.

Define bandwidth.

- Bandwidth describes the overall data transmission capacity of a medium.
- It represents the amount of data that passes through a network connection per unit of time.
- Bandwidth is also measured in bits per second like data rate.

LONG QUESTION

Describe the components of communication system with the help of diagram.

Communication system consists of the following five basic components:

Sender:

It is the device, which sends the message. For example telephone handset etc.

Receiver:

It is the device, which receives the message in other words it is the destination of message that can be a computer, radio, telephone handset, etc.

Message:

It is the data to be transmitted. It can be text, graphics, image, sound or video.

Transmission Medium:

It is the physical pathway over which the message is sent from sender to receiver. Some examples of transmission media are coaxial cable, Fibre optic cable, microwaves etc.

Protocol:

It is the set of rules between the two communicating devices that governs the process of data communication. Without a protocol, two devices may be connected but they cannot communicate with each other.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 4)

Explain asynchronous and synchronous transmission modes with examples.

Asynchronous Transmission:

- The transmission mode in which time interval between each character is not the same is known as asynchronous transmission.
- In this transmission, each character is transmitted with additional control information which consists of additional start and stop bits.
- Start bit is generally 0 and stop bit is 1.
- This transmission is slow. Therefore suitable for low speed connection between system unit and keyboard mouse.

Synchronous Transmission:

- The transmission mode, in which time interval between the characters is always the same, is known as synchronous transmission.
- In this transmission, there is no control information added with the characters.
- Data consisting of 0s and 1s is transmitted as one long stream of bits.
- This transmission is faster than asynchronous transmission because it does not require extra start and stop bits. Therefore, it is used for fast data communication between computers in computer networks.

Describe the following guided media.

a) Twisted pair cable:

- It is the most commonly used cable for data communication. It consists of pairs of copper wires twisted around one another.
- The purpose of twisting the cables is to reduce cross talk and electromagnetic interference.
- Its transmission speed is from 2-10 million bits per second.

b) Coaxial cable:

- It is used for local networks and cable television systems. It consists of copper wire surrounded by insulating layer.
- Insulation reduces interference and distortion.
- Its transmission speed is from 200-500 million bits per seconds.

c) Fiber optic cable:

- It consists of smooth hair-thin strands of transparent material.
- The transmitter has a converter that converts electrical signals into light waves.
- These light waves are transmitted over the Fiber optic cable.
- Another converter is placed at the receiving end that converts the light waves back to electrical signals.
- A single Fiber optic cable can carry up to 50,000 communication lines.
- It provides high quality transmission at extremely fast speed.
- It can transmit trillions of bits per second.
- It is not affected by electromagnetic fields.
- Fiber optic cable is more expensive than twisted pair and coaxial cables.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 4)

Describe types of unguided media.

Radio Waves:

- Radio waves are electromagnetic waves that are propagated by antennas.
- Radio transmission consists of a transmitter and a receiver.
- A transmitter transmits a radio signal to a receiver, which receives it.
- Radio waves are used to transmit music, conversation, pictures and data.
- These waves are invisible and undetectable to human beings.
- The following are some applications of radio waves.
 - Radio and television broadcast.
 - Cell phones communication
 - Satellite communication
 - Wireless networks and wireless internet

Microwave:

- Microwave signals travel through open space like radio waves.
- Microwaves provide much faster transmission rate than telephone lines or coaxial cables.
- Microwave antennas are installed on high buildings or high towers.
- The transmitting and the receiving sites must be within sight of one another.
- Microwaves are used for satellite communication and other long distance wireless communications.

Infra-red:

- Infra-red waves are light energy that we cannot see.
- It travels through space at the speed of light.
- It is used for short distance communication.
- Infra-red waves are usually used in remote controls for television, DVD players and other similar devices.
- It is also used in industrial, scientific and medical appliances and night-vision devices.

Bluetooth:

- Bluetooth is a wireless communication technology that uses radio wave to connect portable electronic devices over short distance.
- It supports networking of wide range of portable devices. For example mobile phone, mouse, keyboard, wireless speaker, wireless headset, tablet, laptop, computer and personal computer.
- The most common use of Bluetooth is connecting a mobile phone to a wireless headset or to a laptop computer.

Satellite:

- A satellite is an object that is placed in an orbit around the earth and revolves around it with speed that is slightly faster than Earth's average orbital speed for communication.
- It is a wireless Receiver and Transmitter used for transmitting data over long distance at high speed.
- Ground stations beam signals through antennas to satellite.
- Satellites amplify and retransmit the signals to another ground station which can be located many thousands of miles away.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT # 4)

- The main drawback of satellite communication is the high cost of placing the satellite into its orbit.
- Satellites are launched by rockets or space shuttles and precisely positioned in the space with an orbit speed that exactly matches with the rotation speed of the earth.

Describe the functions of the following communication devices.

Router:

- Router is a communication device that is used when two or more networks have to be connected for communication.
- They send information from one network to another by selecting the best pathway available.
- There are two types of routers i.e. wired and wireless.

Network Interface Card (NIC):

- A Network Interface Card (NIC) or simply network card is used to connect computers together to create computer network.
- It is a card that is installed on the motherboard.
- In modern computers, it is integrated on the motherboard.
- There are two types of network cards. Wired network card and wireless network card.

Switch/Access Point:

- A switch/access point is used for connecting computers together in local area network (LAN).
- Switch is used in wired networks whereas access point is used in wireless networks.
- A switch/access point receives information from a computer in the network inspects it and then transmits it appropriately to the destination computer.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT 5)

SHORT QUESTIONS

Describe any three difficulties a company may face in running a business without having computer network.

A company may face following difficulties without having computer network:

File sharing:

Without network, nobody can share their files. A network makes it easy for everyone to access the same file. It prevents people from creating different versions accidentally.

Printer sharing:

Over a network, several computers can share the same printer and without network it is impossible.

Share office equipment:

A company can have only 1 printer, 1 scanner and 1 fax machine for whole office if it has a network. Otherwise, this company has to purchase many printers, scanners and fax machines for each employee separately.

What is meant by data transmission?

Data Transmission is the process of sending data from one device to another. It consists of sender, receiver and the medium which carries the information. There are three modes of data transmission:

- i) Simplex
- ii) Half-duplex
- iii) Full-duplex.

Differentiate between Half-duplex and Full-duplex transmission modes.

Half-duplex Transmission Mode:

- A Half-duplex mode can send and receive data/information in both directions but not simultaneously.
- During data transmission, one end is the sender and the other is receiver.
- For example, Half-duplex transmission is used in ATM machines for withdrawal of cash, money transfer and paying bills, etc.

Full-duplex Transmission Mode:

- A Full-duplex mode is used to transmit data/information in both directions simultaneously.
- A Full-duplex mode can transmit more data/information at higher rate.
- For example of Full-duplex mode are communication between computers in a network and communication over telephone line.

Define network architecture?

Network architecture refers to layout of network that consists of computers, communication devices, Software, wired or wireless transmission of data and connectivity between components. A computer network can be as small as two computers linked together by a single cable whereas large networks connect thousands of computers and other devices.

Types of Network Architectures:

- Client/server network
- Peer-to-peer network
- Point-to-point network

COMPUTER SCIENCE FOR 9TH CLASS (UNIT 5)

Differentiate between a server and a client computer.

Server Computer:

A server is a main computer in a network which is used to manage network resources and facilities other computers.

Client Computer:

Clients are computers in a network that access services made available by a server.

Compare LAN and WAN.

Local Area Network (LAN):

- Local area network is commonly used network, it is a network that covers a limited area, usually ranging from a small office to a campus of nearby buildings.
- For example, LAN includes networks within a school, collage, business and organization.
- Data transmission speed over LAN is fast.
- Data communication problems rarely occur.
- Transmission medium is owned by the user organization.

Wide Area Network (WAN):

- Wide Area Network spread over a large area.
- It connects several locations across cities, countries and continents.
- A WAN is often made up of two or more LANs and/or MANs.
- For examples, WAN are used in banks, airlines and NADRA (Pakistan).
- Data transmission speed over WAN is slow.
- Data communication problems often occur.
- Transmission medium is leased lines or public systems such as telephone lines or satellite links.

Mention any three problems which may occur If peer-to-peer network is used for a large number of users in an organization.

- i) In a peer-to-peer network, each computer can play the role of server, client or both at the same time.
- ii) Peer-to-peer networks are suitable for a small number of users, ranging between two to ten computers. Large peer-to-peer networks become difficult to manage.
- iii) It does not provide centralized security. No single person is assigned to administer the resources of network. Individual users have complete control over resources of their computers.

What ISDN?

- ISDN stand for Integrated Services Digital Network.
- It provides a maximum speed of 128kbps which is more than Dial-up connection but less than DSL.
- It can transmit both voice and data at the same time over a single cable.
- ISDN service is being replaced by faster DSL service.

Why star topology is more reliable than bus or ring topology?

Due to following reasons star topology is more reliable than bus or ring topologies.

- Provides fast communication between computers.
- Easy to connect new devices to the network.
- Easy to detect and fix faults.
- Failure of one computer does not stop functioning of the entire network.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT 5)

What is CDMA technology?

- CDMA stands for Code Division Multiple Access.
- It is a wireless cellular communication technology.
- CDMA services include short messaging, voice, data and video transmission.
- It can provide speed of several Mbps for video transmission.

LONG QUESTIONS

What are the advantages of using networks?

The following are some common uses of networks.

Hardware Sharing:

- Network allows sharing of computers hardware such as hard disk and printer etc.
- A hard disk can be attached to a server to share it with other network users.
- A single hard disk can provide storage space to many users.
- A printer can also be connected to a computer to share it with all the other computer users across the network.

Software Sharing:

- Application software can be installed on a server and shared over the network.
- There is no need to install it on all the computers in network separately.

File Sharing:

- A user of a network can easily share files with other users over the network.
- A user can place a file in a shared location on one computer and make it available to other users.
- Users can access, view and modify information stored on another computer in the network.

Internet Sharing:

- A single high-speed Internet connection can be shared with all the users over a network.
- There is no need to provide separate Internet connection to every user on the network.

Describe Client/Server and Peer-to-Peer networks.

Client/Server Network:

- A Server is a main computer in a network.
- Clients are computers in a network that access services from a server.
- In a client/server network, each computer on the network acts as either a server or a client.
- In a client/server network, server shares its resources such as hard disk, printers and Internet connection with client computers.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT 5)

- =====
- Client/server network can be as small as two computers and it can have hundreds and even thousands of computers as well.
- In a Client/server network, a person known as Network Administrator is responsible for sharing resources, creating user accounts and assigning privileges to all the users of the network.

Peer-to-Peer Network:

- In Peer-to-Peer network all computers have the same status.
- Every computer is capable of playing the role of client, server or both at the same time.
- Each computer on the network is known as peer.
- A peer on the network can share as well as access available resources on the network.
- Peer-to-peer network are suitable for a small number of users ranging between two to ten computers.
- No single person is assigned to administer the resources of network.
- Individual users have complete control over resources of their computers.

Describe the types of networks based on area covered.

Based on the geographical distance covered, computer networks are classified into following types:

A) Local Area Network (LAN):

- Local area network is commonly used network, It is a network that covers a limited area, usually ranging from a small office to a campus of nearby buildings.
- For example, LAN includes networks within a school, collage, business and organization.
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- Transmission medium is owned by the user organization.

B) Wide Area Network (WAN):

- Wide Area Network spread over a large area.
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- A WAN is often made up of two or more LANs and/or MANs.
- For examples, WAN are used in banks, airlines and NADRA (Pakistan).
- Data transmission speed over WAN is slow.
- Data communication problems often occur.
- Transmission medium is leased lines or public systems such as telephone lines or satellite links.

C) Metropolitan Area Network (MAN):

- A Metropolitan Area Network (MAN) falls between LAN and WAN. It spans area larger than a LAN but smaller than a WAN.
- Examples of MAN are networks used by telecommunication companies for providing Cable TV and Internet services.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT 5)

- =====
- MAN can connect computers within several blocks of buildings to entire city.
 - Data transmission speed is slower than LAN but faster than WAN.
 - Fiber optic cable or wireless microwave transmission is used as communication medium.

D) Personal Area Network (PAN):

- A personal area network (PAN) is a computer network organized around an individual person.
- Personal area networks typically involve a mobile computer, a cell phone and/or a hand held computing device such as a PDA.
- Users can use these networks to transfer files including emails, calendar appointments, photos and audio/Video files.
- Personal area networks can be wired or wireless.
- Following are the examples of PAN:

Bluetooth:

- The process of setting up a Bluetooth network is referred to as "Pairing".
- Pairing is done through interaction between two users.
- When pairing process completes, a network forms between the two devices and now the devices can communicate with each other.
- Transmission is secure, reliable and fast.
- It can transmit text, images, audio files and video files.

E) Internet (International Network)

- Internet is the largest computer network that connects millions of computers all over the world.
- Computers on the internet are connected together using telephone lines, fiber optics or wireless signals.
- Each computer on the internet has an IP address. IP stands for Internet Protocol. It identifies each computer on the internet with its location.
- Internet has brought a huge revolution in our daily life. It allows people to send e-mail, chat with friends around the world and obtain information on any topic.
- Computer users pay bills, do shopping, find jobs, work at home and do reservation for trains, flights, and hotels through internet.
- Social networking websites such as Facebook and Twitter allow millions of people all over the world to communicate with each other and share their views and ideas.
- **World Wide Web (www) or Web** is the most popular and widely used system to access the Internet. It is a collection of websites available on the Internet. A website contains related webpages that can be accessed using a browser such as Google Chrome or Internet Explorer.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT 5)

Explain the types of network topologies.

The physical arrangement of network nodes is called network topology. A node represents a computer or a network device.

Types of network Topologies:

Four types of network topologies are commonly used which are bus, ring, star and mesh.

A) Bus topology:

It is the simplest network topology. It consists of a single central cable known as bus. All the devices are connected to the bus along its length to communicate with each other. At each end of bus, a device called terminator is attached so that the signals do not bounce back on the bus causing errors.

Advantages of Bus Topology:

- Lowest cost topology to implement due to short cable length.
- Easy to add new computers.
- Easy to setup as compared to Star or Mesh topology.
- Suitable for small networks.

Limitations of Bus Topology:

- If bus is damaged at any point, the entire network stops working.
- Difficult to detect and fix faults.

B) Ring Topology:

The ring network topology is shaped just like a ring. It is like a bus with both ends connected together. All the messages travel in the same direction message from one mode is sent to the next node. It is received by it if it is addressed to it otherwise if is ignored and passed on to the next until the destination is reached.

Advantages of Ring Topology:

- High network performance.
- Server or switch is not required to manage network.
- All the computers have equal opportunity to transmit data.

Limitations of Ring Topology:

- If ring is broken at any point, the entire network stops functioning.
- Detection of fault is difficult.
- If any computer in the ring is not working the whole network is affected.
- Expensive than Star and Bus topologies.

C) Star Topology:

In star topology, all the nodes are connected to central device called switch or hub. It is a one of the commonly used network topologies. A switch can connect 4, 8, 16, 24 or 32 nodes. A switch can be connected to another switch to expand the network.

Advantages of Star Topologies:

- Provides fast communication between computers.
- Easy to connect new devices to the network.
- Easy to detect and fix faults.
- Failure of one computer does not stop functioning of the entire network.

Limitations of Star Topology:

- At least one switch/hub is required for connecting two computers.
- Lengthy cable is required for connecting two computers.
- Costly to implement.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT 5)

D) Mesh Topology:

In mesh network topology, all the network nodes are connected to all other nodes. Message sent on a mesh network, can take any possible path from source to destination, it is not commonly used since it is costly and difficult to implement.

Advantages of Mesh Topology:

- It is the most reliable network topology.
- Alternative paths are available in case a path is broken from source to destination.

Limitations of Mesh Topology:

- Most expensive topology to implement since it requires more cable than Bus, Ring or Star topologies.
- Difficult to implement as compared to other topologies.
- Difficult to add new computer.

Write a note on Dial-up and DSL Internet Connections.

Dial-up Line:

Dial-up line uses standard telephone lines for Internet connection. It required a Dial-up modem that provided a maximum Internet connection speed of 56Kbps. The main advantage of using Dial-up line is that it uses complex network of telephone lines that allows data to be transmitted to almost any location in the world. It is becoming outdated due to very slow Internet connection.

DSL:

DSL (Digital Subscriber Line) provides a very high speed broadband Internet connection. It is called broadband because it has broad range of frequencies for transmitting digital data.

Broadband:

Any type of Internet speed that is 256Kbps or above is known as broadband. Internet Service Providers (ISPs) have several DSL speeds available with different monthly rates.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT 6)

SHORT QUESTIONS

Define cybercrime.

Any crime done by means of computer and information technology by having unlawful access to others computers is called cybercrime.

What is the importance of computer security?

Computer security refers to protecting computer hardware, software and information stored on computer from threats.

Importance of Computer Security:

- Computer users exchange information with each other over internet. This can infect a user's computer with virus or other types of malicious software.
- Computer security or safety is important for computer users to protect their computer from different threats.
- It is necessary to install security software such as firewall, antivirus and spyware on computers.

Differentiate between hacker and cracker.

Hacker:

- A person who **illegally breaks into** others computer systems is known as hacker.
- Hackers are computer experts who try to **gain unauthorized access** to computer systems for **stealing and corrupting** information.
- Most of the hackers break into computers for financial benefits.
- Hackers have in-depth knowledge of network programming and can create tools and malicious software.
- For example, a hacker develops software in which a dictionary files is loaded that contains all the dictionary words. This method works if the user is having a simple password that exists in the dictionary.

Cracker:

- A person who **breaks into computer systems without permission** using hacking tools is known as cracker.
- Most of the crackers **do not have professional computer skill** to hack computer systems but they have knowledge about using hacking tools.
- Crackers break into computers and cause serious damage.
- For example, they also break into Web servers and replace the home page of a website with a page of their own design.

Describe any five symptoms of malware.

- The computer does not start or it reboots automatically when it is on.
- Different types of error messages appear on the screen.
- Programs do not run in a normal way.
- Computer runs very slow.
- New files or folders are created on the hard disk.
- Folders are deleted or changed on the hard disk.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT 6)

Differentiate between authentication and authorization.

Authentication:

- Authentication means identifying a person based on a method such as Username and Password.
- For example when a user wants to login to his email account, he is asked to enter username and password to verify his identity.
- This is authentication.

Authorization:

- Authorization means to give someone permission to do something.
- For example, if correct username and password are entered, the user is authorized or allowed to check his emails, send email or perform other tasks related with email service.
- This is authorization.

Which authentication methodology provides highly secure identification and verification? Justify your answer.

Biometrics provides highly secure identification and personal verification characteristics of individuals such as features of face, hand geometry, retina, voice and fingerprint. Biometrics based systems are used for financial transactions, electronic banking and personal data privacy.

Justification:

- Biometrics provides more accurate authentication than using username and password or PIN.
- Biometrics is associated with a particular individual.
- Hence, it cannot be borrowed, stolen or forgotten.
- Forging in biometrics is practically impossible.

What is meant by information privacy?

- It is individual's right to the privacy of his/her personal information.
- Now a days, people are concerned that computers may be taking away their privacy.
- The Data Protection Act protects the rights of the individuals against misuse of personal organization.
- Organizations that hold the information should not allow unauthorized people to have access to information.

Give any three drawbacks of software piracy?

- Software piracy refers to making of unauthorized copies of copyrighted software and distributing it.
- Pirated software on CDs is a very common source of spreading malware on computers because these are often infected.
- If users download pirated music, movies, programs, etc. for free, their computers may be infected because pirated downloads often contain viruses, spyware or other malicious programs.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT 6)

What types of problems may be faced if computer users do not comply with the moral guidelines of computer ethics?

- Computer users can use Computer to harm other people.
- Computer users can use Computer to break into others computer systems.
- Computer users can read documents and emails of other users without their consent.
- Computer users can use Computer to make illegal copies of copyright software and sell it for financial benefit.
- Computer users who have special computer knowledge and ability will create malicious software and spread it to other computers.
- Computer users can commit any types of crime with the help of computer technology.
- Computer users can not respect the privacy of others.

Name any three places where authentication of people is required.

- Username and password are used to authorize users to have access to computer systems, e-mail account, bank account and other services available on computer.
- PINS are most commonly used with debit and credit cards in retail stores withdraw cash from ATM machines.
- Access cards are commonly used to open security gates in offices where unauthorized people are not allowed to enter.

LONG QUESTIONS

Define malware and describe its types.

Malware is malicious software. It comprises of a number of harmful software that are threats to all computer users. Malware is created for attack on privacy, spying, destruction and financial benefits.

Types of malware:

Most common types of malware are Computer viruses, Worms, Spyware and Adware.

Computer Viruses:

- A computer virus is a type of malware that spreads by inserting a copy of itself into another program or file.
- Most of the viruses are attached to executable files.
- Viruses spread and infect other files when a computer user opens the infected program or file.
- Viruses also spread from infected drive, CD/DVD or infected e-mail attachments.
- Some viruses are not very harmful they are simply annoying.
- Some viruses can seriously damage the hardware, software or the information stored on the computer.
- Viruses can slow down the computer.
- For example MyDoom virus quickly infected the million computers in 2004.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT 6)

Worms:

- A worm is a malware that transmit itself over a network to infect other computers
- Worm can be harmful like a virus.
- It spreads automatically in computer networks and replicates itself.
- It can travel from computer to computer without any human action
- It enters a computer through a weakness in the operating system of the computer.
- Most of the worms cause some harm to the network such as slowing down communication by increasing network traffic.
- For example Code Red and Fizzer

Spyware:

- Spyware programs are developed to spy on computer users by gathering information about their activities on the computer
- Spyware is developed for the personal benefit of the creator.
- It performs secret operations such as stealing password or banking PIN or other personal information about user.
- It infects computers though installation of software form internet.
- It slows down the performance of infected computer.
- Most the spyware is designed to be difficult to remove.
- For example, Flame.

Adware:

- Adware is a malware that attaches itself to free software on the internet and infects computer when such software is downloaded.
- It pops up advertisements during execution of infected program.
- Pop-up block option in browsers helps protect computer from adware.
- Some adware may also collect user information without their permission.

Explain how malware spreads?

The malware spreads by the following ways:

Infected Flash Drives/CDs:

Malware can infect computers in which anti-malware software is not installed through infected flash drives and CDs.

Pirated Software:

Pirated software on CDs is a very common source of spreading malware on computers because these are often infected.

Network and Internet:

Computers connected to network get infected with malware when information is exchanged with other computers. Computers are also infected while using Internet when users download something or browse infected Web sites.

E-mail Attachments:

Opening e-mail attachments from a stranger or from an unknown address can infect computer with malware.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT 6)

Explain how to protect computer systems from virus attacks.

We have to install the following software to safeguard computer against viruses, worms, adware and spyware:

Antivirus software:

- Antivirus software is a computer program that detects and removes viruses and other types of malware.
- Computer user should install it on computer and update it regularly.
- Most antivirus programs have an auto-update feature.
- Whenever a user connects a flash drive or any other type of storage device to computer, he must run it through antivirus software to ensure that it does not contain virus.
- Some commonly used antivirus programs are Norton Antivirus, Kaspersky Antivirus, AVG antivirus, Bit Defender and McAfee Antivirus.

Anti-spyware programs:

- Anti-spyware is a computer program that detects spyware infection on computer and removes them.
- It helps to protect computer against security threats caused by spyware and other types of malware.
- Computer user should install it in computer and regularly update it to safeguard computer against new threats.
- Anti-spyware program runs in the background of computer and continually scans for spyware threats.
- Some commonly used Anti-spyware programs are Norton Anti-spyware, SpySweeper, Spybot-Search & Destroy, Spyware Doctor and AVG Anti-spyware.

What are the common methodologies used for authentication purpose.

Following are common methodologies used for authentication purpose.

Username and Password:

- A username is a name that identifies a person on a computer system.
- Username is generally used with a password.
- The username and password combination is known as login information.
- Username and password are used to authorize users to have access to computer systems, e-mail account, bank account and other services available on computer.
- Username is the known part of user's login information whereas password is secret.
- If it is known by a person it could be misused with bad intention.

Personal Identification Number (PIN):

- PIN is a confidential numeric password used to authenticate a user to get access to a computer system.
- When a user enters the PIN, it is searched in the computer.
- PINS are most commonly used with debit and credit cards in retail stores and many other places for payment of bills.
- It is also used with ATM cards to withdraw cash from ATM machines.

COMPUTER SCIENCE FOR 9TH CLASS (UNIT 6)

Access Cards:

- Access cards are very similar in appearance to credit cards. They do not require username, password or PIN.
- They are commonly used to open security gates in offices and many other places, where unauthorized people are not allowed to enter.
- Access cards are also used to open barriers in parking areas. They are an alternative to key for opening hotel room, etc.

Biometrics:

- Biometrics refers to authentication methods based on physical characteristics of individuals such as features of face, geometry, retina, voice and fingerprint.
- It provides highly secure identification and personal verification technologies. Biometrics based systems are used for financial transactions, electronic banking and personal data privacy.
- It provides more accurate authentication than using username and password or PIN.
- Biometrics is associated with particular individual.
- Hence, it cannot be borrowed, stolen or forgotten. Forging in biometrics is practically impossible.

Define computer ethics and write some important moral guidelines for ethical use of computer technology.

Computer ethics means an acceptable behavior for using computer technology. Computer user should be honest, respect the rights of others on the internet and obey laws that apply to online behavior. We should not use bad language while chatting and social networking. We need to respect others views and should not criticize people.

Ethical Use of Computer:

- i. Computer should not be used to harm other people.
- ii. Computer users should not break into others computer systems to steal, change or destroy information.
- iii. Computer users should not read documents and e-mails of others.
- iv. People should not make illegal copies of copyright software.
- v. Computer programmers users should not create malicious software.
- vi. People should not commit any type of crime with the help of computers.
- vii. Computer users should respect the privacy of others.

COMPUTER SCIENCE FOR 9TH CLASS (OBJECTIVES)

UNIT # 1

Q1. Select the best answer for the following MCQs.

- i. Who invented logarithm?
A Blaise Pascal B John Napier
C Charles Babbage D Herman Hollerith
- ii. Which generation of computer used transistor?
A 1st Generation of Computers B 2nd Generation of Computers
C 3rd Generation of Computers D 4th Generation of Computers
- iii. In which generation of computer microprocessor was introduced?
A 1st Generation of Computers B 2nd Generation of Computers
C 3rd Generation of Computers D 4th Generation of Computers
- iv. Which of the following computer supports thousands of users at the same time?
A Microcomputer B Minicomputer
C Mainframe computer C Laptop computer
- v. Who is responsible for protecting information and information systems from unauthorized people in an organization?
A System Analyst B Information Security Analyst
C Network Administrator D Hardware Engineer
- vi. Which of the following is the fastest memory?
A USB flash drive B RAM
B ROM D Cache
- vii. What type of software a device driver is?
A Application software B Business software
C System software D Productivity software
- viii. Which of the following is volatile memory?
A RAM B ROM
C USB flash drive D Hard disk
- ix. Which software is distributed free of cost for a limited period as a trial version?
A Open source software B Shareware
C Freeware D Productivity software
- x. When were IC chips developed?
A Early 1960s B Early 1970s
C 1980s D 1990s

Answers

i. B	ii. B	iii. D	iv. C	v. B
vi. D	vii. C	viii. A	ix. B	x. A

COMPUTER SCIENCE FOR 9TH CLASS (OBJECTIVES)

UNIT # 2

Answers

i. B	ii. A	iii. C	iv. D	v. B
vi. B	vii. D	viii. B	ix. C	x. B

COMPUTER SCIENCE FOR 9TH CLASS (OBJECTIVES)

UNIT # 3

Q1. Select the best answer for the following MCQs.

- i. Which of the following software is used for creating professional documents?
A Spreadsheet Software B Word processor
C Typing Tutor D Both A and B
- ii. Which of the following tab of Word Ribbon contains Clipboard group?
A Page Layout B Insert
C File D Home
- iii. By default how many tabs are there in Word Ribbon?
A 7 B 8 C 9 D 10
- iv. What is used for creating decorative effects in Word?
A Paragraph formatting B Text formatting
C Page formatting D WordArt
- v. Which of the following tab contains the commands for creating charts in Excel?
A Home B Formulas
C Insert D Data
- vi. Which of the following command in Excel allows the user to view only certain data in a worksheet based on a condition?
A Data validation B Data filtering
C Conditional formatting D Data manipulation
- vii. Which of the following command in Excel restricts user from entering wrong data in cells of a worksheet?
A Data validation B Data Filtering
C Conditional formatting D Data manipulation
- viii. Which of the following command is used to apply formatting to one or more cells based on the value of the cell?
A Data validation B Data filtering
C Conditional formatting D Data manipulation
- ix. Which of the following shortcut keys are used for pasting selected text?
A Ctrl+C B Ctrl+X
C Ctrl+V D Ctrl+P
- x. Which of the following command is used in Word to select the entire document?
A Double-click B Triple click
C Ctrl+Single click D Shift+Single click

Answers

i. B	ii. D	iii. C	iv. D	v. C
vi. B	vii. A	viii. C	ix. C	x. B

COMPUTER SCIENCE FOR 9TH CLASS (OBJECTIVES)

UNIT # 4

- Q1.** Select the best answer for the following MCQs.
- i. In which type of data transmission start/stop bits are used?
A. Synchronous transmission B. Asynchronous transmission
C. Satellite transmission D. Microwave transmission
- ii. In which of the following transmission, the time interval between the characters is always the same?
A. Synchronous transmission B. Asynchronous transmission
C. Satellite transmission D. Microwave transmission
- iii. Which of the following transmission media uses light waves for transmitting information?
A. Coaxial cable B. Twisted pair cable
C. Telephone line D. Fibre optic cable
- iv. Which of the following is used for short distance communication?
A. Radio signals B. Microwave
C. Infra-red D. Satellite communication
- v. In which of the following impairment, the strength of signal falls off with distance?
A. Distortion B. Attenuation
C. Cross talk D. Noise
- vi. Which of the following impairment refers to undesired signals that enter the path of the transmitted signal due to electromagnetic radiation?
A. Distortion B. Attenuation
C. Cross talk D. Noise
- vii. Which of the following device is used for connecting computers together in wireless local area network?
A. Dial-up modem B. Router
C. Switch D. Access point
- viii. Which of the following device is used for connecting computers together in wired local area network?
A. Dial-up modem B. Router
C. Switch D. Access point
- ix. Which of the following device forwards information from one network to another by selecting the best pathway available?
A. Dial-up modem B. Router
C. Switch D. Access point
- x. What represents the overall data transmission capacity of a computer network?
A. Data rate B. Bandwidth
C. Signal strength D. Baud rate

Answers

i. B	ii. A	iii. D	iv. C	v. B
vi. C	vii. D	viii. C	ix. B	x. B

COMPUTER SCIENCE FOR 9TH CLASS (OBJECTIVES)

UNIT # 5

- Q1.** Select the best answer for the following MCQs.
- i. In which of the following transmission mode, information is transmitted in both directions but not simultaneously?
A Simplex mode B. Half-duplex mode
C. Full-duplex mode D. High speed mode
 - ii. In which of the following network, every computer can act as client, server or both at the same time?
A. Client/server network B. Peer-to-peer network
B Point-to-Point network D Local area network
 - iii. Which of the following network provides centralized security?
A Client/server network B Peer-to-peer
C Point-to-Point network D Local area network
 - iv. Which of the following computer shares resources on a network for others to use?
A Desktop computer B. Client
C Server D. Microcomputer
 - v. Which of the following topology is most expensive to implement?
A Star B Bus
C Ring D. Mesh
 - vi. In which of the following network topology, switch is required?
A Star B Bus
C Ring D. Mesh
 - vii. Which of the following network is used to provide Cable TV and Internet services?
A Local area network B. Wide area network
C Metropolitan area network D Point-to-Point network
 - viii. Which of the following provides high speed Internet connection?
A Dial-up connection B. DSL connection
C ISDN connection D. CDMA connection
 - ix. Which of the following network connects computers across cities, countries and continents?
A Local area network B. Wide area network
C Metropolitan area network D. Client/Server network
 - x. Which of the following network topology uses a device called terminator?
A Ring topology B. Mesh topology
C Bus topology D. Star topology

Answers

i. B	ii. B	iii. A	iv. C	v. D
vi. A	vii. C	viii. B	ix. B	x. C

COMPUTER SCIENCE FOR 9TH CLASS (OBJECTIVES)

UNIT # 6

Q1. Select the best answer for the following MCQs.

- i. What is a person who illegally breaks into others' computer systems called?
A Computer engineer B System programmer
C Hacker D Cracker
- ii. What is a person who uses special tools for breaking into computer systems called?
A Computer engineer B System programmer
C Hacker D Cracker
- iii. Which malware spreads automatically in computer networks and replicates itself?
A Virus B Worm
C Adware D Spyware
- iv. Which of the following malware displays advertisements on the screen?
A Virus B Worm
C Adware D Trojan
- v. Which of the following authentication method is used for opening security gates?
A Username and password B Personal Identification Number
C Access card D Biometrics
- vi. Which of the following authentication method is most reliable?
A Username and password B Personal Identification Number
C Access card D Biometrics
- vii. Which of the following authentication method is based on features of individuals such as face, fingerprint and voice?
A Username and password B Personal Identification Number
C Access card D Biometrics
- viii. What is making illegal copies of copyright software for use on other computers or sale called?
A Information privacy B Intellectual rights
C Software piracy D Information ownership
- ix. Which of the following malware gathers information about user activities on computer?
A Virus B Worm
C Adware D Spyware
- x. Which of the following authentication methodology is used to draw cash from ATM?
A Username and password B Personal Identification Number
C Access card D Biometrics

Answers

i. C	ii. D	iii. B	iv. C	v. C
vi. D	vii. D	viii. C	ix. D	x. B

GLOSSARY

Adware:

A type of malware that attaches itself to free software on the Internet and infects other computers when it is downloaded

Analog Computer:

A computer that represents and processes data by measuring quantities such as voltage and current to solve a problem

Application Software:

Software developed for computer users to solve their problems

Asynchronous Transmission:

A method of data transmission in which time interval between characters is not the same

Attenuation:

Strength of signal fall off with distance in guided or unguided media.

Bandwidth:

Overall data transmission capacity of a medium or channel

Bluetooth:

Bluetooth is a wireless communication technology that uses radio waves to connect portable electronic devices over short distance.

Bus Topology:

A topology that consists of a single central cable known as bus, to which all the devices are connected along its length to communicate with each other.

Cache:

Very small amount of extremely fast memory inside the microprocessor or on the motherboard

Client Computer:

A computer that accesses the resources that are shared by other computers in a network

Client/Server Network:

A network in which each computer acts as either a server or a client.

Command Line Interface (CLI):

User interface in which commands are given to computer with keyboard

Computer Ethics:

Moral guidelines concerned with the ethical use of computer technology.

Computer Network:

Interconnection between computers and devices to provide facilities among users to exchange information and share resources such as printer, hard disk, Internet, etc.

Computer Software:

A set of instructions that tells a computer what to do and how to do

COMPUTER SCIENCE FOR 9TH CLASS (OBJECTIVES)

Computer Virus:

A type of malware that spreads by inserting a copy of itself into another program or file

Cross Talk:

Interference that occurs in guided media when undesired signals enter the path of transmitted signals

Cybercrime:

Any crime committed by means of computer and Internet technology

Data Validation:

Allowing only certain values or the type of data that is defined by the user to be entered into cells in Excel.

Database Administrator:

A person who is responsible for the design, implementation and maintenance of a database in an organization.

Digital Computer:

A general-purpose programmable machine that works with binary digits and has the ability to store, retrieve and process data at high speed

Distortion:

Change in form of digital signal when it reaches the receiver during data transmission

Expansion Slots:

Long narrow sockets on the motherboard used for installing expansion cards

Filtering Data:

Displaying only the information that the user needs based on a condition in Excel

Full-duplex Mode:

A type of data transmission mode used to transmit data/information in both directions simultaneously

Graphical User Interface (GUI):

A type of user interface that is based on windows, icons, menus and pointer.

Guided Media:

Transmission media that uses cabling system that guides data signals along a specific path

Hacker:

A person who illegally breaks into computer systems to destroy, modify or steal information

Half-duplex Mode:

A type of data transmission mode used to transmit data/information in both direction but not simultaneously.

Hybrid Computer:

A type of computer that is a combination of analog and digital computers.

IC Chip:

A silicon chip that contains a large number of transistors

COMPUTER SCIENCE FOR 9TH CLASS (OBJECTIVES)

Language Processor:

System software used to translate computer programs into machine language

Local Area Network (LAN):

A network that covers a limited area such as a small office or a campus of nearby buildings

Mesh Topology:

A topology in which all the network nodes are connected to all the other nodes

Metropolitan Area Network (MAN):

A network that spans area larger than LAN but smaller than WAN such as a city

Motherboard:

Main circuit board inside the system unit that contains microprocessor, main memory, expansion cards, many IC chips, connectors and other electronic components

Network Administrator:

A person responsible for installation, configuration and maintenance of computer networks in organizations.

Network Interface Card (NIC):

Expansion card used to connect computers together to create computer network

Network Topology:

Physical arrangement of network nodes. A node represents a computer or a network device

Operating System:

A collection of system software that controls the working of computer system.

Output Devices:

Devices used to display text, graphics and images on monitor or print on paper.

Peer-to-Peer Network:

A network in which all the computers have the same status and there is no distinction at all between servers and clients.

Personal Identification Number (PIN):

A confidential numeric password used to authenticate a user to get access to a computer system

Ports:

Interface used for connecting various devices to the system unit.

Protocol:

Set of rules between two communicating devices that govern the process of data communication.

Registers:

Small memory units inside the microprocessor used to temporarily store some information during the execution of a program.

Ring Topology:

A topology shaped just like a ring to which nodes are connected.

COMPUTER SCIENCE FOR 9TH CLASS (OBJECTIVES)

Router:

Communication device that is used when two networks have to be connected for communication.

Server Computer:

A computer that shares resources for others to use on a network.

Simplex Mode:

A type of transmission mode that provides data/information transmission in only one direction

Software Piracy:

Making illegal copies of software for use or sale for financial benefit.

Spreadsheet:

A grid of rows and columns in which numbers and text are entered.

Spyware:

A type of malware developed to spy on computer users by gathering information about their activities.

Star Topology:

A topology in which all the nodes are connected to a central device called switch

Switch/Access Point:

Communication device used for connecting computers together in a local area network

Synchronous Transmission:

A method of data transmission in which time interval between characters is always the same

System Software:

A collection of programs which makes the use of computer easy and efficient

System Unit:

Main part of computer that consists of motherboard, power supply and drives inside the computer casing

Transmission Medium:

Physical pathway over which data is sent from sender to receiver.

Unguided Media:

Transmission of data signals through open space, that is, without using cables

Wide Area Network:

A network that spans a large area, connecting several locations of an organization across cities, countries and continents.

Word Processing:

Use of computer to create, edit, format and print documents.

Word Processor:

Computer application software used for the creation of documents on computers

Worm:

A type of malware that transmits itself over a network to infect other computers.

